INTERNATIONAL COUNCIL
FOR CAPITAL FORMATION

November 2005

THE COST OF THE KYOTO PROTOCOL

Moving Forward on Climate Change Policy While Preserving Economic Growth

1. BACKGROUND

The Kyoto Protocol entered into force as an international treaty for those countries that had ratified it on February 16, 2005. The International Council for Capital Formation (ICCF) has published a series of in-depth studies, analysing the broader economic repercussions of adopting Kyoto for the UK, Germany, Italy and Spain and specifically its impact for each nation on:

- Carbon dioxide emissions
- Energy consumption
- Energy prices
- Gross domestic product (GDP)
- Employment levels

For copies of the individual country reports on Italy, Spain and the UK, please visit the ICCF website at www.iccfglobal.org. The German report will be available on November 15.

2. OVERVIEW

The analysis, which was prepared by Global Insight Inc. an international economic modelling firm, assumes that the cost of emission allowances under Kyoto would be passed along to consumers in the form of higher energy prices and ultimately high prices for all goods and services. Consumers' purchasing power would be reduced by the higher cost of using energy, reducing real disposable income.

Output and employment losses would also be expected because:

- energy-using equipment and vehicles would be made prematurely obsolete
- consumers would be rattled by rapid increases in living costs
- financial ministers concerned over possible inflation would most likely need to target more slack in the economy to deflate non-energy prices and thus stabilize the overall price environment.

Consumption and residential fixed investment would be the hardest hit components of real GDP because of the direct loss in real disposable income.

The economy's potential to produce would fall below Base Case levels initially with the cut back in energy usage, since energy is a key factor of production. Stronger investment would be required over the longer-term to build capital as a substitute for

this lost factor. The decline in consumption and residential fixed investment relative to Base Case levels, however, would have a depressing impact on business fixed investment in the near-term.

Labour productivity would decline because the other factors of production would be less efficient. Only as investment grows and the capital stock is expanded would productivity begin to improve.

Post 2012, the impact on economic performance would begin to lessen if the target emission level under the Kyoto Protocol were maintained. The extreme change in the energy prices experienced during the years between 2008 and 2012 would not be repeated. While the percentage change in prices relative to the baseline would increase somewhat, the year-over-year change in prices would be reduced. However, achieving targets that are even more aggressive, would take ever larger carbon fees, and would continue to take a significant toll on economic performance. For example, if countries were to adopt a post 2012 target of a 60 percent reduction in CO2 by 2050, Italian industry would pay 54 percent more for natural gas in 2020 and UK industry would pay 57 percent more (Figure 1).

Figure 1 – Electricity and gas prices

	ELECTRICITY		NATURAL GAS	
	2010	**2020**	**2010**	**2020**
Italy	13%	14%	44%	54%
UK	35%	34%	46%	57%
Spain	23%	27%	42%	51%
Germany	31%	32%	30%	39%

2010: KYOTO TARGET
2020: 60% below 2000 levels by 2050

Figure 2 – GDP

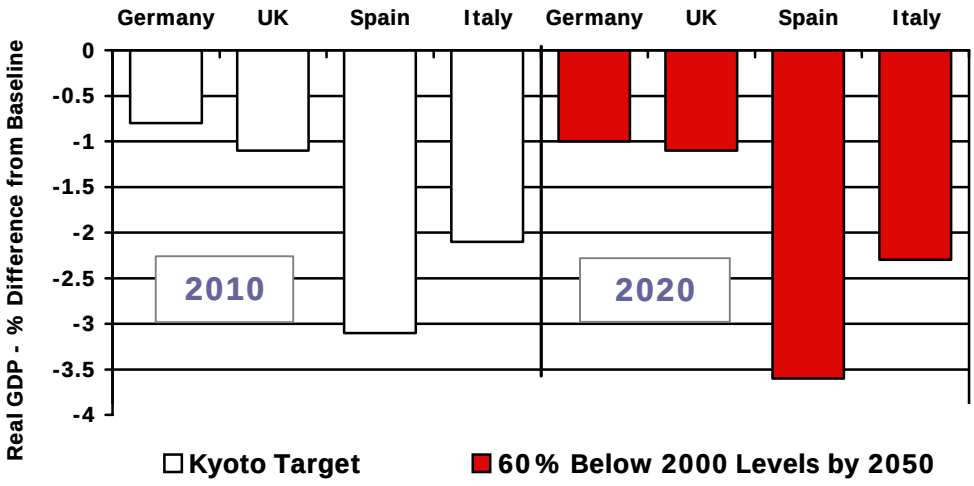
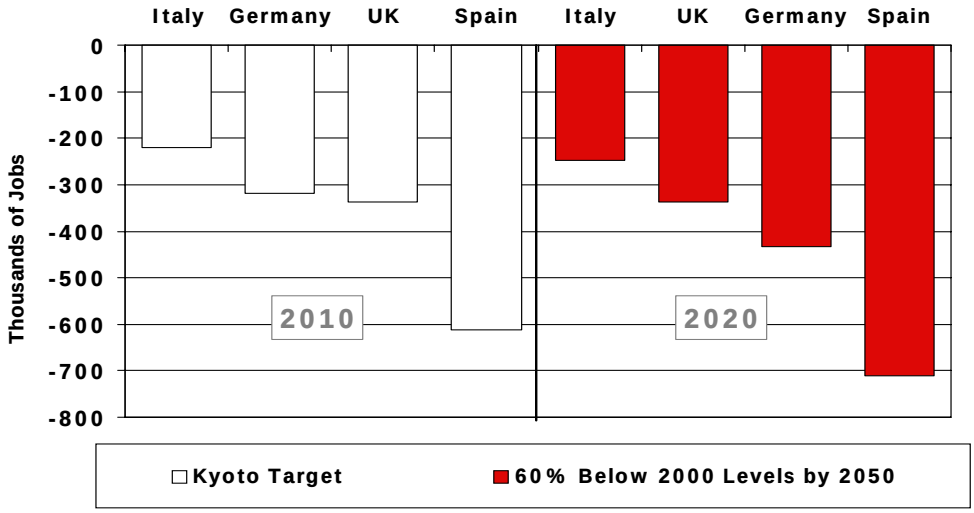


Figure 3 – Employment



3. IMPACT OF KYOTO ON ENERGY CONSUMPTION

Domestic Sector

- Dramatically higher energy prices would force consumers to cut energy consumption.

- Since there is only limited opportunity to substitute more energy efficient appliances and furnaces for the period 2008-2012, consumers would reduce their consumption of energy services.

- Longer term, consumers would attempt to replace some of these services by replacing their energy consuming equipment.

Industry Sector

- Industry would respond to the dramatically higher prices through several mechanisms:

  - reducing energy consumption through process change.
  - replacing energy-consuming capital with more efficient capital.
  - where possible, production of energy intensive goods would move to non-participating countries.

Power Sector

- The imposition of carbon permits would lead to extremely large increases in the delivered price of electricity, particularly to the industrial sector.

- Imposition of ever decreasing carbon permit levels would set in motion dramatic changes in this sector.

- Coal use would decline, slowly at first and then rapidly, as the price drove electricity prices up, reducing demand and encouraging the substitution of natural gas or renewables.

- Investment in natural gas fired generating capacity would alleviate some of the pressure on electricity prices, but with the ever increasing stringency of the target, investment in end-use efficiency would need to be as great or greater than improvements in power supply efficiency.

- For this analysis, it was assumed that nuclear and hydroelectric energy would not change.

Transportation Sector

- Due to the high taxes already in place on transportation fuels, the percentage change in price due to the addition of the carbon permit fees is less than the change in price in other sectors.

- Longer term, the permit price would have to be high enough to reduce energy use in this sector as the target tightens.

- Even assuming an international carbon dioxide emission allowance trading scheme, meeting the Kyoto targets would result in the following:

    - Coal, with the highest carbon content of the energy sources, would be the hardest hit.
    - Petroleum would experience the smallest percentage decline of the fossil fuels because of strong demand and limited technology substitution options in the transportation sector over the forecast horizon.
    - Natural gas demand would initially increase relative to the baseline as it is substituted for coal and petroleum but ultimately would need to decline as the cutbacks in demand required to meet ever tightening CO_2 limits outweigh this substitution effect.
    - The demand for renewables would increase in all the cases.

4. A WAY FORWARD ON CLIMATE POLICY

- Avoid policies which do not meet cost-benefit tests including mandated caps on carbon emissions from mobile and stationary sources.

- Remove barriers to developing world's access to more energy and cleaner technology by promoting economic freedom and market reforms.

- Increase R&D for new technologies to reduce energy intensity.

- Develop sequestration through both natural and man-made technologies.

- Promote nuclear power for electricity.

- Expand bilateral cooperation with developing countries.

- Promote a truly global solution such as the new Asia-Pacific Partnership for Clean Development and Climate.